REMARKS

With this amendment, claims 1-15 and 56-64 are pending in the present application.

Status of the specification

The amendments to the specification at pages 6-8 enter SEQ ID NOS:3-30 for the corresponding antigens at their appropriate locations in the specification. These sequence identifiers correspond to those in the Substitute Sequence Listing submitted herewith. In each instance, the related application numbers have been rearranged to specify that application in which the corresponding SEQ ID NOS: cited for the relevant antigen DNA and protein sequences may be found.

The sequences contained in SEQ ID NOS:3-30 in the present Substitute Sequence Listing are found in the related applications incorporated by reference on page 8, lines 8-14, and on page 58, lines 20-22, and thus are not new matter. The references cited, Verbon *et al., J. Bact.* 174:1352-1359 (1992) for α-crystalline antigen, and Content *et al., Infect. & Immunol.* 59:3205-3212 (1991) for 85 complex antigen, respectively, are incorporated by reference on page 8, lines 1-4 and page 58, lines 20-22, and thus are not new matter.

On page 6, line 31, a typographical error in the U.S. patent application No. 09/056,556 has been corrected. This application number may be found in the correct form on page 6, line 17, and on page 8, line 10, where it is properly incorporated by reference.

Status of the claims

Claims 1, 2, 3, 5, 6, 9, 55, and 62 have been amended to correct typographical errors in the amendment filed on July 2, 2001. The amendment filed on July 2, 2001 inadvertently contained errors in claim numbering and omitted the amended claim 5 from the clean copy, which was misnumbered as claim 10 in Appendix A,

"VERSION WITH MARKINGS TO SHOW CHANGES MADE." The misnumbering continued in Appendix B "PENDING CLAIMS WITH ENTRY OF THE AMENDMENT." For the convenience of the Examiner, enclosed is a copy of the Amendment filed on July 2, 2001 marked in red to show the corrections to the amended claims.

Claim 63 and 64 have been added. These claims add no new matter. Support for these claims can be found, e.g., in the specification on page 63, line 4.

Sequence listing

Applicants request entry of this amendment in adherence with 37 C.F.R. §§ 1.821 to 1.825. This amendment is accompanied by a floppy disk containing the above named sequences, SEQ ID NOS:1-30, in computer readable form, and a paper copy of the sequence information which has been printed from the floppy disk.

The information contained in the computer readable disk was prepared through the use of the software program "PatentIn" and is identical to that of the paper copy.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,

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APPENDIX A

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraphs beginning at page 6, line 12 to page 8, line 4 have been amended as follows:

The following provides sequences of some individual antigens used in the compositions and fusion proteins of the invention:

MTB32A (TbRa35FL) (SEQ ID NOS:3 and 4 of the present application), the sequence of which is disclosed as SEQ ID NO:17 (cDNA) and SEQ ID NO:79 (protein) in the U.S. patent application No. 08/659,683 and is also disclosed in U.S. patent applications No. 08/523,436, 08/523,435, No. 08/658,800, ~~No. 08/659,683,~~ No. 08/818,112, No. 09/056,556, and No. 08/818,111 and in the WO97/09428 and WO97/09429 publications ~~applications~~, *see also* Skeiky *et al., Infection and Immunity* 67:3998-4007 (1999);

MTBRa12, the C-terminus of MTB32A (Ra35FL) (SEQ ID NOS:5 and 6 orf the present application), comprising at least about the last 132 amino acids from MTB32A from *M. tuberculosis,* the sequence of which is disclosed as SEQ ID NO:4 (DNA) and SEQ ID NO:66 (predicted amino acid sequence) in the U.S. patent application No. 09/072,967;

Ra35, the N-terminus of MTB32A (Ra35FL), comprising at least about the first 205 amino acids of MTB32A from *M. tuberculosis*, the nucleotide and amino acid sequence of which is disclosed in Figure 4 (SEQ ID NOS:1 and 2 of the present application);

MTB39 (TbH9) (SEQ ID NOS:7 and 8 of the present application), the sequence of which is disclosed as SEQ ID NO:106 (cDNA full length) and SEQ ID NO:107 (protein full length) in the U.S. patent application No. 08/659,683 and is also

disclosed in U.S. patent applications No. 08/658,800, ~~No. 08/659,683,~~ No. 08/818,112, and No. 08/818,111 and in the WO97/09428 and WO97/09429 publications ~~applications~~. The sequence is also disclosed as SEQ ID NO:33 (DNA) and SEQ ID NO:91 (amino acid) in U.S. patent application No. 09/056,556 09/056,559 (SEQ ID NOS:25 and 26 of the present application).~~;~~

The following provides sequences of some fusion proteins of the invention:

TbH9-Ra35 (MTB59F) (SEQ ID NOS:9 and 10 of the present application), the sequence of which is disclosed as SEQ ID NO:23 (cDNA) and SEQ ID NO:24 (protein) in the U.S. patent application No. 09/287,849 as originally filed and in the PCT/US99/07717 application;

RA12-TbH9-Ra35 (MTB72F) (SEQ ID NOS:11 and 12 of the present application), the sequence of which is disclosed as SEQ ID NO:1 (DNA) and SEQ ID NO:2 (protein) in the US patent application No. 09/223,040, ~~No. 09/223,040,~~ and in the PCT/US99/07717 application.

The following provides sequences of some additional antigens used in the compositions and fusion proteins of the invention:

MTB8.4 (DPV) (SEQ ID NOS:13 and 14 of the present application), the sequence of which is disclosed as SEQ ID NO:101 (cDNA) and SEQ ID NO:102 (protein) in the U.S. patent application No. 08/659,683 and is also disclosed in U.S. patent applications No. 08/658,800, ~~No. 08/659,683,~~ No. 08/818,112 and No. 08/818,111 and in the WO97/09428 and WO97/09429 publications applications;

MTB9.8 (MSL) (SEQ ID NOS:15 and 16 of the present application), the sequence of which is disclosed as SEQ ID NO:12 (DNA), SEQ ID NO:109 (predicted amino acid sequence) and SEQ ID NO:110 to 124 (peptides) in the U.S. patent application No. 09/073,010 and is also disclosed in U.S. patent applications No. 08/859,381, No. 08/858,998~~,~~ and No. 09/073,009 ~~and No. 09/073,010~~ and in the PCT/US98/10407 and PCT/US98/10514 applications;

MTB9.9A (MTI, also known as MTI-A) (SEQ ID NOS:17 and 18 of the present application), the sequence of which is disclosed as SEQ ID NO:3 and SEQ ID NO:4 (DNA) and SEQ ID NO:29 and SEQ ID NO:51 to 66 (ORF peptide for MTI) in the U.S. patent application No. 09/073,010 and is also disclosed in U.S. patent applications No. 08/859,381, No. 08/858,998~~,~~ and No. 09/073,009 ~~and v09/073,010~~ and in the PCT/US98/10407 and PCT/US98/10514 applications. Two other MTI variants also exist, called MTI-B and MTI-C;

MTB40 (HTCC#1) (SEQ ID NOS:19and 20 of the present application), the sequence of which is disclosed as SEQ ID NO:137 (cDNA) and 138 (predicted amino acid sequence) in the U.S. patent application No. 09/073,010 and is also disclosed in U.S. patent application ~~applications~~ No. 09/073,009 ~~and No. 09/073,010~~ and in the PCT/US98/10407 and PCT/US98/10514 applications;

MTB41 (MTCC#2) (SEQ ID NOS:21 and 22 of the present application), the sequence of which is disclosed as SEQ ID NO:140 (cDNA) and SEQ ID NO:142 (predicted amino acid sequence) in the U.S. patent application No. 09/073,010 and is also disclosed in U.S. patent application ~~applications~~ No. 09/073,009 ~~and No. 09/073,010~~ and in the PCT/US98/10407 and PCT/US98/10514 applications;

ESAT-6 (SEQ ID NOS:23 and 24 of the present application), the sequence of which is disclosed as SEQ ID NO:103 (DNA) and SEQ ID NO:104 (predicted amino acid sequence) in the U.S. patent application No. 09/072,967. The sequence of ESAT-6 is also disclosed in U.S. Patent No. 5,955,077;

α-crystalline antigen (SEQ ID NOS:27 and 28), the sequence of which is disclosed in Verbon *et al., J. Bact.* 174:1352-1359 (1992);

85 complex antigen (SEQ ID NOS:29 and 30), the sequence of which is disclosed in Content *et al., Infect. & Immunol.* 59:3205-3212 (1991).

IN THE CLAIMS:

Claims 1, 2, 3, 5, 6, 9, 55, and 62 have been amended as follows:

1. (Twice Amended) A composition comprising a MTB39 antigen, having an amino acid sequence of SEQ ID NO:8 or 26 ~~SEQ ID NO:91 or 107~~, or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex, and a MTB32A antigen, having an amino acid sequence of SEQ ID NO:4 ~~SEQ ID NO:79~~, or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex.

2. (Twice Amended) The composition of claim 1, comprising a MTB39 antigen, having an amino acid sequence of SEQ ID NO:8 or 26 ~~SEQ ID NO:91 or 107~~, or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex, and a polypeptide comprising at least 205 amino acids of the N-terminus of a MTB32A antigen (SEQ ID NO:4) ~~(SEQ ID NO:79)~~ from a *Mycobacterium* species of the tuberculosis complex.

3. (Twice Amended) The composition of claim 2, further comprising a polypeptide comprising at least about 132 amino acids from the C-terminus of MTB32A antigen (SEQ ID NO:4) ~~(SEQ ID NO:79)~~ from a *Mycobacterium* species of the tuberculosis complex.

5. (Twice Amended) The composition of claim 4, wherein the fusion polypeptide has the amino acid sequence of MTB59F (SEQ ID NO:10) ~~(SEQ ID NO:24)~~.

6. (Twice Amended) The composition of claim 4, wherein the fusion polypeptide is encoded by a polynucleotide that hybridizes under stringent hybridization conditions to the complement of a polynucleotide comprising the nucleotide sequence of MTB72F (SEQ ID NO:11) ~~(SEQ ID NO:1)~~.

9. (Twice Amended) The composition of claim 1, further comprising at least one additional antigen from a *Mycobacterium* species of the tuberculosis complex,

wherein the antigen is selected from the group consisting of MTB8.4 antigen (SEQ ID NO:14) ~~(SEQ ID NO:102)~~, MTB9.8 antigen (SEQ ID NO:16) ~~(SEQ ID NO:109)~~, MTB9.9A ~~MTB9.9~~ antigen (SEQ ID NO:18) ~~(SEQ ID NO:29)~~, MTB40 antigen (SEQ ID NO:20) ~~(SEQ ID NO:138)~~, MTB41 antigen (SEQ ID NO:22) ~~(SEQ ID NO:142)~~, ESAT-6 antigen (SEQ ID NO:24) ~~(SEQ IDNO:104)~~, MTB85 complex antigen (SEQ ID NO:30), or α-crystalline antigen (SEQ ID NO:28), or an immunogenic fragment thereof.

55. (Once Amended) The composition of claim 1 ~~claim 6~~, further comprising at least one additional antigen from a *Mycobacterium* species of the tuberculosis complex, wherein the antigen is selected from the group consisting of MTB8.4 antigen (SEQ ID NO:14) ~~(SEQ ID NO:102)~~, MTB9.8 antigen (SEQ ID NO:16) ~~(SEQ ID NO:109)~~, MTB9.9A ~~MTB9.9~~ antigen (SEQ ID NO:18) ~~(SEQ ID NO:29)~~, MTB40 antigen (SEQ ID NO:20) ~~(SEQ ID NO:138)~~, MTB41 antigen (SEQ ID NO:22) ~~(SEQ ID NO:142)~~, ESAT-6 antigen (SEQ ID NO:24) ~~(SEQ IDNO:104)~~, MTB85 complex antigen (SEQ ID NO:30), or α-crystalline antigen (SEQ ID NO:28), or an immunogenic fragment thereof.

62. (Once Amended) The composition of claim 6, wherein the fusion polypeptide has the amino acid sequence of MTB72F (SEQ ID NO:12) ~~(SEQ ID NO:2)~~.